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ABSTRACT

The concept of verbal self-regulation, or verbal mediation, originated in behavioristic analyses of thinking, but was later extended to cognitivistic analyses. In both applications, the research that was generated was usually deficient in ecological validity. In addition, in some of the research verbal self-regulation was inferred when an overt analogue--vocalizing aloud--occurred before the instrumental behavior and not when the vocalizing occurred after the instrumental behavior. The reasoning is faulty because the overt analogue could be mediated rather than mediating. A new line of research, concerning knowledge about self-regulation, is suggested. (Author/SS)

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VERBAL SELF-REGULATION IN HISTORICAL PERSPECTIVE[1]

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Abstract: The concept of verbal self-regulation, or verbal mediation, originated in behavioristic analyses of thinking, but was later extended to cognitivistic analyses. In both applications, the research that was generated was usually deficient in ecological validity. In addition, in some of the research verbal self-regulation was inferred when an overt analogue--vocalizing aloud--occurred before the instrumental behavior and not when the vocalizing occurred after the instrumental behavior. The reasoning is faulty because the overt analogue could be mediated rather than mediating. A new line of research, on knowledge about self-regulation, is suggested.

I was asked by the conveners of this symposium, Drs. Zivin and Fuson, to put the topic of the symposium into historical perspective and to predict its future, rather than to discuss the individual papers. I mention this instruction at the outset so that the audience and the participants will not misinterpret my failure to mention the papers as a failure to have done my homework.

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In the United States, the concept of verbal self-regulation had its origins in behaviorism. John B. Watson's (1930, chap. 10) conception of thinking as covert speech seems to be well known, but his further elaboration (chap. 11) that thinking also involves covert nonspeech behaviors seems to be less well known. The notion that thinking, or cognition in general, includes "restrained acting" as well as "restrained speaking" antedates Watson; for example, Alexander Bain advocated this notion, and even earlier it was advocated by Plato. More recently, the notion has been promoted by Dollard and Miller (1950) and B. F. Skinner (1959). Skinner, however, has added the important point that the behavior need not be covert: "thought is simply behavior--verbal or nonverbal, covert or overt" (1957, p. 449).

The early research on thought, conceptualized as covert behavior, involved attempts at direct observation by means of electromyography or

attempts at indirect observation by means of theoretical inference. The problem with the "direct" approach, as I noted in a much-ignored paper published in 1971, is that it cannot produce definitive evidence because the observed muscle movements could be produced by thought rather than being thought. The problem with the indirect approach is that it requires inference, and inference requires a theory; therefore, the inference could be wrong if the theory is wrong. I will return to these points later.

Another problem with the early research on thought is that it was "overcontrolled." That is, in bringing the behavioral theory into the laboratory to test its predictions, researchers attempted to control extraneous variables by decomposing thought into its simplest elements. Thus, for example, thought became single words, simple images, and simple motor acts such as button-pushing and switch-throwing, instead of sentences, redintegrative imagery, and complex motor skills. This simplification was encountered not only in the research laboratory, of course; in fact, it was motivated by simplification in the relevant theories. Hull (1939), for example, attributed stimulus equivalence to three alternative sources, one of which was "secondary or indirect" generalization, or mediation in the behavioral sense that became standard--mediation by cue-producing responses (Dollard & Miller, 1950; Miller, 1948).

It was within this tradition that I formulated the mediational deficiency hypothesis in 1962. Although I did not distinguish between production and mediation deficiencies (or production and control deficiencies, in Kendler's 1972 terms) in that paper, I discussed the distinction in a paper published the next year (Reese, 1963). However, I did not use

these terms in the latter paper, because Flavell did not introduce them in this context until several years later. My discussion was apparently not widely understood, perhaps because it was expressed in the terms of traditional learning theory. As I expressed it in the 1963 paper: "alternative explanations of mediational deficiency might be that it results from (a) a failure of conditioning of the mediator on set-inducing trials or (b) a failure of the previous conditioning of other responses to the concept" (p. 157). In Hull-Spence learning theory, which provided the theoretical framework for my early work on mediational deficiency, "mediators," "sets," and "concepts" are conditioned responses that produce cues that can be conditioned to other responses. Therefore, both (a) production deficiency and (b) mediation deficiency must result from inadequate conditioning. A conditioned response, in this kind of theory, is elicited inexorably if the appropriate stimulus is presented (and the subject is appropriately motivated and free from interference from competing habits).

Judging from the amount of research generated, it is apparent that Flavell, Beach, and Chinsky (1966) presented the distinction between production and mediation deficiencies in a way that was understood widely, and not restricted to the Hull-Spence camp. In addition, Flavell (1970) extended the concept of mediation beyond the simple cue-producing responses to which it had been limited in Hull-Spence theory, and applied it to mnemonic strategies and other complex cognitive operations. This usage is much more consistent with Vygotsky's usage (see below) than with the Hull-Spence usage; but although Flavell (1970) cited Vygotsky's theory of stages in the internalization of speech, he did not cite Vygotsky's

conception of mediation.

In Vygotsky's theory, which is essentially the modern Soviet theory (Reese, in press), cognitive development amounts to increasing self-control which functions to control (understand, adapt to) the environment. The increasing self-control is brought about by "mediation," according to Vygotsky (1978), and language provides the most powerful means of mediation. However, as Cole and Scribner (1978) emphasized, Vygotsky's conception of mediation is not the same as the behavioristic conception. In the behavioristic conception, as already noted, mediation involves stimulus-response associations; but in Vygotsky's conception mediation is a system of actions. The system can be physical or mental, as in the use of tools and the use of symbols, respectively. In both cases, mediation is a means of actively transforming the world in order to transform the self (Vygotsky, 1978, pp. 54-55).

Language is involved in the higher forms of mediation, then, and therefore the internalization of speech--the part of the theory emphasized by Flavell--is important in cognitive development. Speech acquires a planning, self-directive function in addition to its social, descriptive function; it becomes a means for refraction (refraction and reflection are similar to Piaget's assimilation and accommodation, respectively; see Reese, in press). However, in the Soviet theory, as in American behaviorism, language is not the only mode of cognition, although it is the best mode.

In the tasks I used to study mediation the developmental trend turned out to be fragile, and therefore I abandoned this line of research in favor of a much stronger phenomenon, the effect of redintegrative

imagery on learning and memory. In my first research on this phenomenon, I found the analogue of mediational deficiency, but again the developmental trend turned out to be fragile, and I have finally come to suspect that the deficiency is not in the young children but in the tasks we presented to them in the psychological laboratory.

As the first discussant in a symposium on memory development at the 1971 meeting of the Society for Research in Child Development, Flavell (1971) suggested that memory is mostly applied cognition, and therefore memory development is mostly applied cognitive development. As the second discussant, Jenkins (1971) agreed, but only if reasonable tasks are presented. As Jenkins said, "If . . . we give the head stupid things to do by 'brute force,' it can only do relatively stupid things with the task" (p. 285). That consideration should drive us from the laboratory to the natural environment--a very promising move as we have seen in the papers presented at this symposium.

Another methodological point, in addition to the just-mentioned need for ecologically valid, or naturalistic research, is the basis for inferring that covert self-regulatory speech has occurred. An often used methodology is to make the speech overt and to assess its timing relative to the overt instrumental performance. Speech is assumed to be regulatory if it precedes the instrumental response, and is assumed to be descriptive if it occurs simultaneously with or after the instrumental response. For example, in several studies of multidimensional discriminative learning, children have been asked to tell, before making an instrumental response, what stimulus element they will base their next instrumental response upon. Young children often fail to comply with

this instruction, and instead tend to report what they have just been doing--describing, apparently, instead of self-regulating (Cantor & Spiker, 1977; Spiker & Cantor, 1977). The same phenomenon has been obtained in American attempts to replicate the Luria (1961) "squeeze/don't squeeze" phenomenon (Miller, Shelton, & Flavell, 1970). The problem, alluded to earlier, is that the overt speech is not necessarily the mediator; it could be mediated rather than mediating, and therefore its timing relative to the instrumental response is not crucial. Thus, observing that the overt speech refers to the previous choice, or occurs simultaneously with or after the present choice, does not demand the conclusion that the choice was unmediated. By the same reasoning, however, observing that the overt speech preceded the choice does not demand the conclusion that the choice was mediated. In other words, the timing of overt behavior is not direct evidence about mediation. We are left, then, as I argued in 1971, with no possible direct evidence about covert mediators.

I would like to end by suggesting a possible new line of inquiry. In 1971, Flavell introduced the concept of metamemory, or knowledge about memory and memorizing, and the "meta" concepts have subsequently blossomed everywhere. Flavell, for example, extended it to "metacognition" (1976) and "metacommunication" (Note 1), and Howie-Day (Note 2) presented a paper this morning on "metapersuasion." Flavell (1978) and others (e.g., Brown & DeLoache, 1978) have deplored the explosion of "meta's," but perhaps it would be fruitful to study "meta-self-regulatory-speech." Hopefully, no one will ever call it that again, but I seriously suspect that we may find some promising new lines of research if we ask children what they know about self-regulation. It could be a publication, because it has not been done before, as far as I know; and it might turn out to be a contribution.

Reference Notes

1. Flavell, J. H. The development of metacommunication. Paper given at the International Congress of Psychology, Paris, July 1976.
2. Howie-Day, A. M. Metapersuasion: The development of reasoning about persuasive strategies. Paper presented at the meeting of the Society for Research in Child Development, San Francisco, March 1979.

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Footnote

[1]This paper was the Discussion in G. Zivin & K. C. Fuson (Chair), Do they really talk to themselves? Recent naturalistic studies of the development of verbal self-regulation. Symposium presented at the meeting of the Society for Research in Child Development, San Francisco, March 1979.